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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,886	06/19/2003	Dror Shemesh	PDC/7822	5920

7590 05/05/2004
PATENT COUNSEL
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EXAMINER

HASHMI, ZIA R

ART UNIT PAPER NUMBER

2881

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/600,886	Applicant(s) SHEMESH, DROR	
	Examiner Zia R. Hashmi	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-38 are rejected under U.S.C. 103(a) as being unpatentable over Sievers et al. (US 2002/0195422 A1), in view of Winters et al. (4,226,666).
3. With respect to independent claims 1, 12, 23 and 32, Sievers et al. disclose a method and apparatus of reducing or removal of ion contamination in an object, the ion contamination introduced by an ion milling step (Abstract, line 1, para 0004, lines 1-2, para 0003, lines 9-13, and para 0005, lines 1-3), comprising the steps of defining a suspected ion contaminated area (para 0015, lines 1-12), removing the suspected ion contaminated area by an ion beam (para 0001, lines 3-6, para 0004, lines 5-7, para 0005, lines 3-7, and para 0009, lines 6-10). Their method is also applicable to milling an integrated circuit by a rapid milling process (para 0015, lines 9-12).
4. With respect to dependent claims 2, 7, 13, 18, 24, 29, and 33, Sievers et al. disclose a method and apparatus where the ion beam consists of Gallium metal ions (para 0018, lines 1-2) and wherein the object is an integrated circuit (para 0001, lines 3-6, para 0015, lines 9-12).
5. With respect to claims 1, 3-6, 8-12, 14-17, 19-23, 25-28, 30-32, and 34-38, Sievers et al. fail to disclose use of a non-contaminating process (such as directing

an electron beam toward the removed area while allowing the beam to interact with additional material). Winters et al., however, disclose a method and apparatus for removing any area on a substrate, which can be removed by electron beam etching (col. 1, lines 15-20, col. 2, lines 41-48 & 59-64, col. 3, lines 3-10, col. 4, lines 13-16, and Fig. 1-3), which is a non-contaminating process since the electron beam does not introduce any external contaminating ions. Thus, the use of electron beam to remove or etch out undesired areas on a surface of substrate of a semiconductor is a well known practice (col. 1, lines 15-27) in semiconductor manufacturing industry.

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to combine the methods and apparatus of Sievers and Winters et al. and add features like defining a suspected contaminated area and removing it in one step within the fabrication or inspection process of the substrate, because Sievers et al. teach (para 0001, lines 3-6) that in the fabrication of integrated circuits, focused ion beam is frequently used to mill away (etch) material by irradiating an ion beam onto a substrate.

Conclusion

5. DeMarco et al. disclose (5,288,368) direct-writing electron beam apparatus, which not only can be used for writing patterns on a substrate, but also removing entire thickness of a layer on it.

6. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published


Art Unit: 2881

applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact Electronic Business Center (EBC) at 866-217-9197 (toll-free).

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zia Hashmi whose telephone number is (571) 272-2473. The examiner can normally be reached between 8.30 AM- 5 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571) 272-2477.

Zia Hashmi

April 21, 2004.


JOHN R. LEE
SUPERVISORY PATENT ENGINEER
TECHNOLOGY CENTER 2881